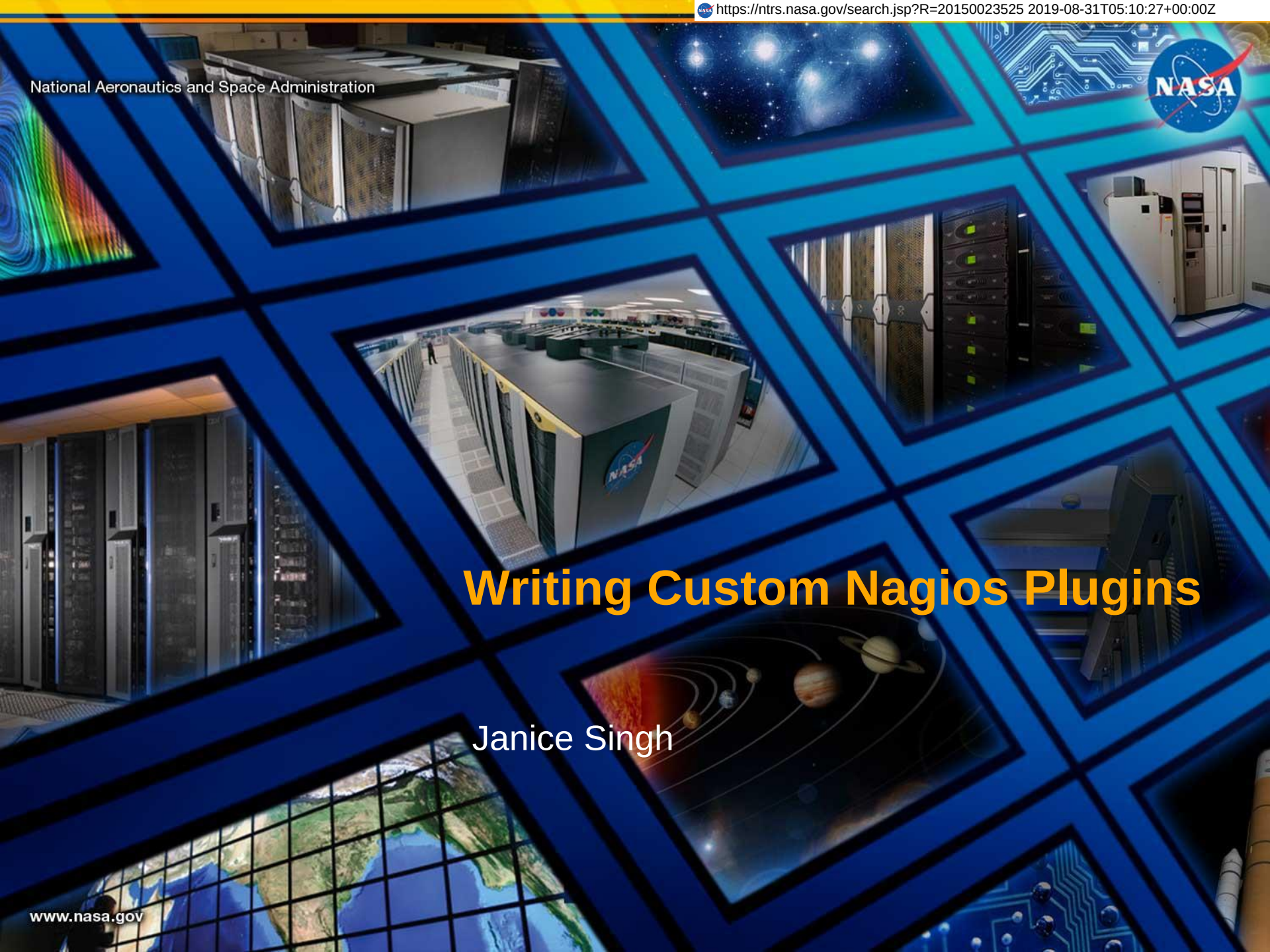


Writing Custom Nagios Plugins

Janice Singh

Introduction

- About the Presentation
  - audience
    - anyone with basic nagios knowledge
    - anyone with basic scripting/coding knowledge
  - what a plugin is
  - how to write one
  - troubleshooting
- About Me
  - work at NAS (NASA Advanced Supercomputing)
  - used Nagios for 5 years
    - started at Nagios 2.10
    - written/maintain 25+ plugins

NASA Advanced Supercomputing

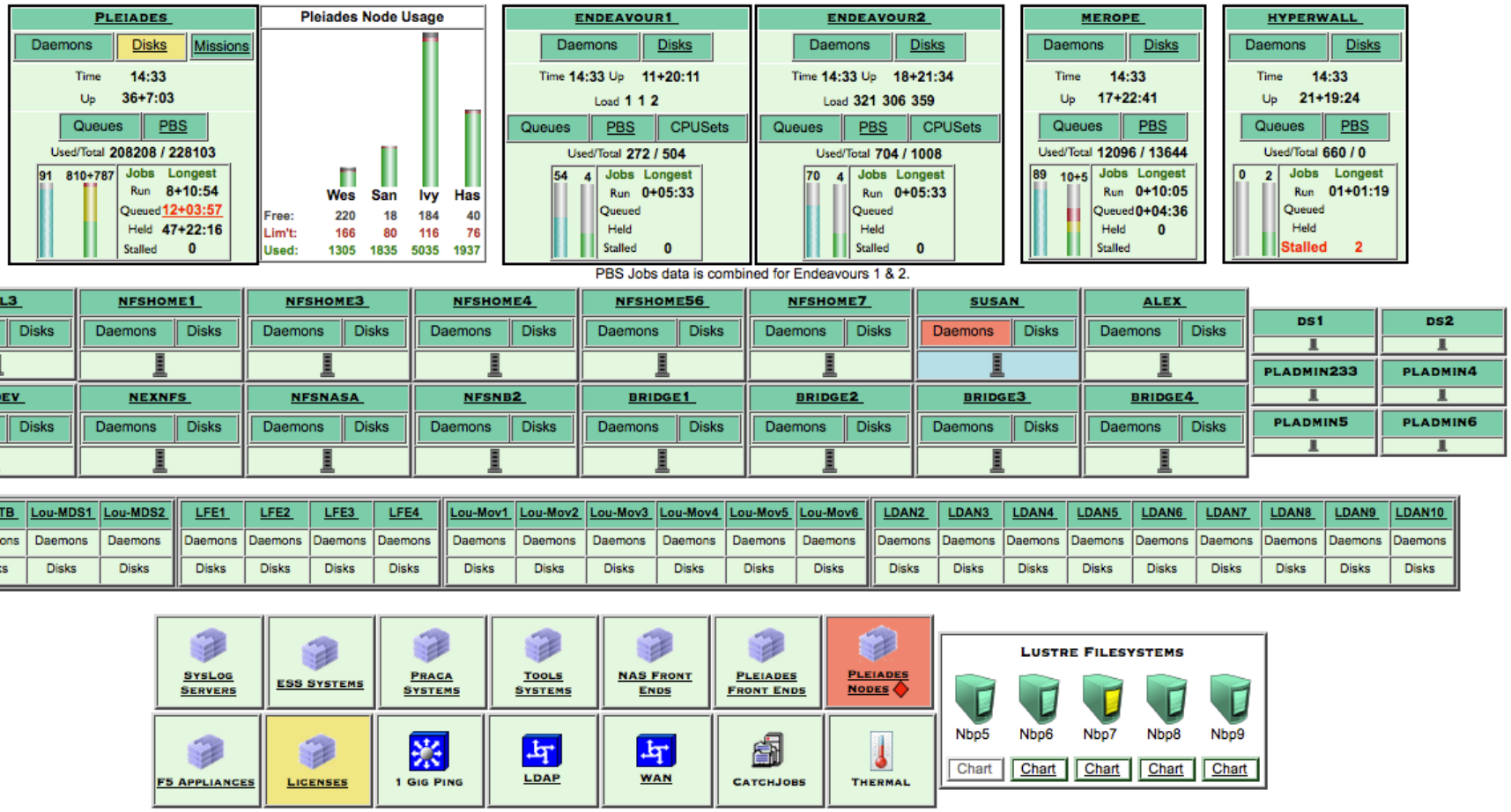
- Pleiades
  - 11,312-node SGI ICE supercluster
  - 184,800 cores
- Endeavour
  - 2 node SGI shared memory system
  - 1,536 cores
- Merope
  - 1,152 node SGI cluster
  - 13,824 cores
- Hyperwall visualization cluster
  - 128-screen LCD wall arranged in 8x16 configuration
  - measures 23-ft. wide by 10-ft. high
  - 2,560 processor cores
- Tape Storage - pDMF cluster
  - 4 front ends
  - 47 PB of unique file data stored

Ref: http://www.nas.nasa.gov/hecc/

Nagios at NASA Advanced Supercomputing

- one main Nagios server
- systems behind firewall send data by nrdp
- some clusters behind firewall
  - one cluster uses nrpe for gathering data
  - other clusters use ssh
- Post processor prepares visualization (HUD) data
  - separate daemon
  - Nagios APIs provide configuration and status data
  - provides file read by HUD
  - general architecture adaptable for other uses

HUD


PLEIADES
Daemons
Disks
Missions
Time 14:33
Up 36+7:03
Queues
PBS
Used/Total 208208 / 228103
91
810+787
Jobs Longest
Run 8+10:54
Queued 12+03:57
Held 47+22:16
Stalled 0
Pleiades Node Usage
Wes San Ivy Has
Free: 220 18 184 40
Lim't: 166 80 116 76
Used: 1305 1835 5035 1937
ENDEAVOUR1
Daemons
Disks
Time 14:33 Up 11+20:11
Load 1 1 2
Queues
PBS
CPUSets
Used/Total 272 / 504
54
4
Jobs Longest
Run 0+05:33
Queued
Held
Stalled 0
ENDEAVOUR2
Daemons
Disks
Time 14:33 Up 18+21:34
Load 321 306 359
Queues
PBS
CPUSets
Used/Total 704 / 1008
70
4
Jobs Longest
Run 0+05:33
Queued
Held
Stalled 0
MEROPE
Daemons
Disks
Time 14:33
Up 17+22:41
Queues
PBS
Used/Total 12096 / 13644
89
10+5
Jobs Longest
Run 0+10:05
Queued 0+04:36
Held 0
Stalled
HYPERWALL
Daemons
Disks
Time 14:33
Up 21+19:24
Queues
PBS
Used/Total 660 / 0
0
2
Jobs Longest
Run 01+01:19
Queued
Held
Stalled 2
PBS Jobs data is combined for Endeavours 1 & 2.
PBSPL3
Daemons
Disks
PBS
NFSHOME1
NFSHOME3
NFSHOME4
NFSHOME56
NFSHOME7
SUSAN
ALEX
MONDEV
NEXNFS
NFSNASA
NFSND2
BRIDGE1
BRIDGE2
BRIDGE3
BRIDGE4
DS1
DS2
PLADMIN233
PLADMIN4
PLADMIN5
PLADMIN6
Lou-TB
Lou-MDS1
Lou-MDS2
LFE1
LFE2
LFE3
LFE4
Lou-Mov1
Lou-Mov2
Lou-Mov3
Lou-Mov4
Lou-Mov5
Lou-Mov6
LDAN2
LDAN3
LDAN4
LDAN5
LDAN6
LDAN7
LDAN8
LDAN9
LDAN10
SYSLOG SERVERS
ESS SYSTEMS
PRACA SYSTEMS
TOOLS SYSTEMS
NAS FRONT ENDS
PLEIADES FRONT ENDS
PLEIADES NODES
F5 APPLIANCES
LICENSES
1 GIG PING
LDAP
WAN
CATCHJOBS
THERMAL
LUSTRE FILESYSTEMS
Nbp5
Nbp6
Nbp7
Nbp8
Nbp9
Chart

Plugins – Nagios extensions

- Built-in plugins
  - Aren't truly built-in, but they come standard when you install nagios-plugins
    - check_disk
    - check_ping
- Custom plugins
  - Let you test anything
  - The sky's the limit - if you can code it, you can test it

What are Plugins?

Nagios configuration to define a service that will use the plugin check_mydaemon.pl:

```
define service {
        host                    linuxserver2
        service_description     Check MyDaemon
        check_command           check_mydaemon
}

define command {
        command_name            check_mydaemon
        command_line            check_mydaemon.pl –w 5 –c 10
}
```

Reasons to write your own plugin

- There isn’t a plugin out there that tests what you want
- You need to test it differently

Guidelines

- Any Language you want
- There is only one rule: it must return a nagios-accepted value

ok (green)	0
warning (yellow)	1
critical (red)	2
unknown (orange)	3

Plugin Psuedocode

- General outline of what a plugin needs to do:
  - initialize object (if object oriented code)
  - read in the arguments
  - set variables
  - do the test
  - return results
- This is just a suggestion

For Perl: Nagios::Plugin

```
# Instantiate Nagios::Plugin object (the 'usage' parameter is mandatory)

my $p = Nagios::Plugin->new(
    usage => ”usage_string",
    version => $version_number,
    blurb => ‘brief info on plugin',
    extra => ‘extended info on plugin’
);
```

For Perl: Nagios::Plugin (cont).

```
# adding an argument  ex: check_mydaemon.pl -w
# define help string neatly – use below instead of qq
my $hlp_strg = ‘-w, --warning=INTEGER:INTEGER\n’ .
                    ‘ If omitted, warning is generated.’;
 $p->add_arg(
        spec => 'warning|w=s’,
        help =>  $hlp_strg
       required => 1,
       default => 10,
);

#accessing the argument
$p->opts->warning
```

For Perl: Nagios::Plugin (cont).

```
# finishing the script:
$p->nagios_exit(
        return_code => $p->check_threshold($result),
        message => " info on what $result means"
);

# if you are not using check_threshold use text for return code:
return_code => ‘OK|WARNING|CRITICAL|UNKNOWN’
```

For Perl: Nagios::Plugin (cont).

- When you've done your code and have $result to compare to the thresholds:
  - $return_code = $p->check_threshold($result)
  - follows nagios convention of min:max
    - check_mydaemon.pl –w 5 will warn on anything > 5
    - check_mydaemon.pl –w :5 will warn on anything > 5
    - check_mydaemon.pl –w 5: will warn on anything < 5
    - check_mydaemon.pl –w 5:7 will warn on anything <5 or >7
    - if you overlap critical and warning, critical has precedent

Overcoming issues

- Test needs elevated privilege
  - nagios can be run as root but is not secure
  - run the test as root via cronjob; write info to a flat file
  - use nagios plugin to read and process the file
- Output of the test was too big
  - the resulting nrdp command hit a kernel limit
  - use ssh to get the output to the main nagios server ex: ssh blah blah
  - use plugin on the main server to process it

Nagios perfdata

- Nagios is designed to allow plugins to return optional performance data in addition to normal status data
  - in nagios.cfg enable the process_performance_data option.
  - Nagios collects this information to be displayed on the GUI
  - in the format “|key1=value1,key2=value2,…,keyN=valueN
  - this can be anything that has a numerical value

Troubleshooting

- The Nagios display says: return code XXX is out of bounds
  - your script returns anything other than 0,1,2,3
  - otherwise it is a nagios error.
    - Google is your friend
      - ex: 13 usually means a permission error
      - sometimes all it tells you is “something went wrong”
  - these disappeared at our site when we switched to Nagios::Plugin
- try running the plugin from the command line
  - verify who you are running as
  - verify the arguments passed in

Troubleshooting (cont).

- Timing is everything!
  - launching too many processes
  - files can get overwritten
    - by cron jobs
    - by multiple nagios processes
- if perfdata is enabled, the perfdata log is the most useful

Questions

- Any Questions